**Cisco Modes**

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| **Description** | **Keyboard short cut** |
| User mode | Switch> |
| Enter Privilege mode | Switch>**enable** |
| Privileged mode | Switch# |
| Enter configuration mode | Switch#**configure terminal**  Switch#**conf t** |
| Global Config mode | Switch(config)# |
| Enter Interface mode | Switch(config)#**interface fa0/1** |
| Interface mode | Switch(config-if) |
| Return to global  configuration | Switch(config-if)**exit** |
| Exit Global Config mode | Switch(config)#**exit** |
| Return to use mode | Switch#**disable** |
| Logout | Switch>**exit** |

**Device Configuration**

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| **Description** | **Commands** |
| Configure device system  name | Switch(config)#**hostname sw1**  Switch(config)#**hostname sw2** |
| Sets the encrypted enable  password | Switch(config)#**enable secret cisco** |
| Sets the unencrypted enable  password | Switch(config)#**enable password cisco** |
| Enable password encryption on all clear text password  within the configuration file | Switch(config)#**service password-encryption** |
| Require that a minimum of 10 characters be used for all passwords. | Router(config)#**security passwords min-length 10** |
| Configure a Message Of The Banner, with an ending  character of $ | Switch(config)#**banner motd #**  **Unauthorized access is strictly prohibited. #** |
| Creating a local user in the local database of the router | Router(config)#**username admin privilege 15 secret adminpass1** |
| Assign IP address to vlan or router | **IPv4:**  Switch(config)#**int vlan 1**  Switch(config-if)#**ip addr 172.22.1.11** **255.255.255.0**  Switch(config-if)#**no shutdown**  Switch(config-if)#**description** <enter the tekst>  **IPv6** =  Switch(config-if)#**int vlan 1**  Switch(config-if)#**ipv6 addr 2001:DB8:CAFE:2::1/64**  Switch(config-if)#**no shutdown**  Switch(config-if)#**ipv6 unicast-routing**  Switch(config-if)#**description** <enter the tekst>  **Serial=**  Switch(config)#**int serial 0/0/0**  Switch(config-if)# |
| Create a VLAN on the switch and give it a name. | Switch(config)#**vlan 99**  Switch(config-vlan)#**name Management**  Switch(config-vlan)#**exit** |
| Assign port F0/5 to VLAN 99 on the switch. | S1(config)#**interface f0/5**  S1(config-if)#**switchport mode access**  S1(config-if)#**switchport access vlan 99**  S1(config-if)#**end** |
| Configure sticky port security on a switch. | S1(config)#**interface f0/19**  S1(config-if)#**switchport mode access**  S1(config-if)#**switchport port-security**  S1(config-if)#**switchport port-security maximum 10**  S1(config-if)#**switchport port-security mac-address sticky**  S1(config-if)#**end** |
| Assign Default gateway, note  the mode.  Assign IPv6 (Link-Local) on a router only! | Switch(config)#**int vlan1**  Switch(config-if)#**ip default-gateway 10.1.1.1**  Switch(config-if)#**description Gateway for VLAN 1**  Router(config)#**int Gig0/1**  Router(config-if)#**ipv6 addr FE80::1 link-local**  Switch(config-if)#**description Link-local address for VLAN 1** |
| Select one interface | Switch(config)#**int fa0/1** |
| Select a range of interfaces  (version dependant) | Switch(config)#**int range fa0/1 – 12** |
| Set the interface description | Switch(config-if)#**description** |
| Add vlan using config mode | Switch(config)#**vlan 11**, switch(config-vlan)#**name test** |
| Configure duplex speed and full duplex | Switch(config)#**int f0/1**  Switch(config-if)#**speed 100**  Switch(config-if)#**duplex full**  Switch(config-if)#**end** |
| Configure the auto-MDIX | Switch(config)#**int f0/1**  Switch(config-if)#**speed 100**  Switch(config-if)#**duplex full**  Switch(config-if)#**mdix auto**  Switch(config-if)#**end** |
| Assign interface to vlan | Switch(config-if)#**switchport access vlan 11** |
| Enable Port Security. | Switch(config-if)#**switchport mode access**  Switch(config-if)#**switchport port-security**  Switch(config-if)#**switchport port-security mac-address sticky** |
| Disable Interface | Switch(config-if)#**shutdown** |
| Enable Interface | Switch(config-if)#**no shutdown** |
| No shutdown (IPv6) | Router/Switch(config-if)#**no shutdown**  Router/Switch(config-if)#**ipv6 unicast-routing** |

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| Configures 5 Telnet sessions  each with a password of  ‘cisco’ | Switch(config)#**line vty 0 4**  Switch(config-line)#**password cisco**  Switch(config-line)#**login** |
| Enable and define console password of ‘cisco’ | Switch(config)#**line con 0**  Switch(config-line)#**password cisco**  Switch(config-line)#**login** |
| Changing Telnet to SSH  Changing SSH to Telnet | Router(config)#**line vty 0 4**  Router(config-line)#**transport input SSH**  Router(config)#**line vty 0 4**  Router(config-line)#**transport input Telnet** |
| Modify the default SSH configuration. | Switch#**config t**  Switch(config)#**ip ssh time-out 75**  Switch(config)#**ip ssh authentication-retries 2** |
| Full SSH configuration. | Router(config)#**ip domain-name CCNA-Lab.com**  Router(config)#**crypto key generate rsa [enter] 1024**  Router(config)#**username admin privilege 15 secret cisco**  Router(config)#**line vty 0 4**  Router(config-line)#**login local**  Router(config-line)#**transport input SSH**  Router(config-line)#**exit**  Router(config)#**ip ssh version 2**  Router(config)#**ip ssh time-out [seconds]**  Router(config)#**ip ssh authentication-retries [number]** |
| Synchronise console messages (keep what you  have typing on the screen) | Switch(config-line)#**logging synchronous** |
| Creating a user in the local database of the router. | Router(config)#**username admin privilege 15 secret adminpass** |
| Generating a crypto key modulus. | Router(config)#**crypto key generate rsa modulus 1024** |
| Set the timezone and  automatically adjust | Switch(config)#**clock timezone gmt 0**  Switch(config)#**clock summer-time gmt recurring** |
| Sets the switch priority for the vlan. This combined with the switch mac address  creates the switch BID | Switch(config)#**spanning-tree vlan 1 priority 4096** |
| Enables portfast | Switch(config)#**int fa0/1**  Switch(config-if)#**spanning-tree portfast** |
| Enables RSTP. Other  options are, PVST and MST | Switch(config)#**spanning-tree mode rapid-pvst** |
| Creates a vlan. Note this now done in config mode not vlan database. Also note the ‘int vlan’ command does  **NOT** create vlans | Switch(config)#**vlan 2**  Switch(config-vlan)#**name sales** |
| Assign an interface to vlan 2 | Switch(config-if)#**switchport access vlan 2** |
| Unconditionally forces an interface into trunking. Other options are access and  dynamic | Switch(config)#**interface vlan1**  Switch(config-if)#**switchport mode trunk** |
| Manually assign a switch to a VTP domain. A switch will automatically become part of a VTP domain if it’s currently in the ‘null’ domain and  receives a VTP frame | Switch(config)#**vtp domain lab** |
| Changes the VTP mode from the default ‘server’ mode to client mode. In client mode  no changes can be made | Switch(config)#**vtp mode client** |
| Enable the http server to  SDM can be used | Router(config)#**ip http server** |

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| Defines a username and password. The list can be used for many things from PPP authentication to user  access | Router(config)#**username sue password cisco** |
| Defines a local host file. Like  /etc/hosts in unix | Router(config)#**ip host mypc 10.1.1.3** |
| Disables DNS lookup. Useful when a command as been  miss typed | Router(config)#**no ip domain-lookup** |
| Sets the logical (not physical) bandwidth of interface. This is used by routing protocols, SNMP queuing etc | Router(config)#**int s0**  Router(config-if)#**bandwidth** |
| Sets the physical clock | Router(config-if)#**clock rate 64000** |
| Set the serial interface WAN encapsulation. Other options  are PPP or frame-relay | Router(config-if)#**encapsulation hdlc** |
| Authentication on PPP is optional. This command enable chap on the interface.  Other option PAP | Router(config-if)#**ppp authentication chap** |
| Defines the type of LMI being used. If left unconfigured the correct LMI type should be automatically detected | Router(config-if)#**frame-relay lmi-type cisco** |
| Defines a static route. Renumber static routes have an admin distance of 1. Therefore will over ride any dynamic routing. | Router(config)#**ip route network-address subnet-mask exit-intf**  Router(config)#**ip route 50.0.0.0 255.0.0.0** **10.1.2.1** |
| In a default route, either the next-hop IP address or exit interface can be specified to configure a default static route | Router(config)#**ip route 0.0.0.0 0.0.0.0** (ip-address or exit-intf) |
| Configure a recursive IPv6 static route | Router(config)#**ipv6 route <ipv6-prefix/prefix-length> <next-hop-ipv6-address>** |
| Configure a recursive static route | Router(config)#**ip route 192.168.1.0 255.255.255.0 10.1.1.2** |
| Configure a directly connected static route | Router(config)#**ip route 192.168.0.0 255.255.255.0 s0/0/0** |
| Remove static routes  Remove static IPv6 route: | Router(config)#**no ip route 209.165.200.224 255.255.255.224 serial0/0/1**  Or  Router(config)#**no ip route 209.165.200.224 255.255.255.224 10.1.1.2**  Or  Router(config)#**no ip route 209.165.200.224 255.255.255.224**  Router(config)#**no ipv6 route 2001:DB8:ACAD:B::/64 serial 0/0/1** |
| Default route configuration | Router(config)#**ip route 0.0.0.0 0.0.0.0 s0/0/1** |
| Enables RIP version 1 on all LOCAL interfaces which  have a 10.x.x.x address  Enables RIP version 2 | Router(config)#**router rip**  Router(config-router)#**network 10.0.0.0**  Router(config-router)#**version 2** |
| Enable the router to provide a DHCP service. | Router(config)#**ip dhcp pool MYPOOL**  Router(dhcp-config)#**network 10.1.1.0**  **255.255.255.0**  Router(dhcp-config)#**default-router 10.1.1.1**  Router(dhcp-config)#**dns-server** **198.105.232.4**  Router(dhcp-config)#**exit**  Router(config)#**ip dhcp excluded-address**  **(First IP) (Last IP)** |
| Acquire an IP address for from the Dynamic Host Configuration Protocol  Remove an IP address for from the Dynamic Host Configuration Protocol | Switch(config)#**int fa0/1**  Switch(config-if)#**ip address dhcp**  Switch(config-if)#no shutdown  Switch(config)#**int fa0/1**  Switch(config)#**no ip address dhcp**  Switch(config)#**no shutdown** |
| Configure an IP helper-address on a routed interface. | Router(config)#**int f1/0**  Router(config-if)#**ip address 192.168.1.10 255.255.255.0**  **Router(config-if)#ip helper-address 172.16.32.32** |
| Changes the config register which controls what the router does when the router boots | Router(config)#**config-register 0x2102** |

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| Creates a logical sub interface below the physical interface    Enables 802.1q trunking on  the interface    Define the ip address | Router(config)#**int fa0/0.1**        Router(config-subif)#**encapsulation dot1Q 1**      Router(config-subif)#**ip address 10.1.1.1**  **255.255.255.0** |
| Enable OSPF on any local interface which start with the ip address 10.1.x.x. Note the  inverted mask | Router(config-)#**router ospf 1**  Router(config-router)#**network 10.1.0.0**  **0.0.255.255 area 0** |
| EIGRP can be configured in a similar way to RIP or the  mask option could be used | Router(config)#**router eigrp 1**  Router(config-router)#**network 172.16.0.0** Or  Router(config-router)#**network 172.16.2.0**  **0.0.0.255** |
| Defines a standard ACL.  Standard ACL use number  1-99 | Router(config)#**access-list 1 permit**  **172.16.1.1** |
| Defines an Extended ACL. The first address is the source IP address | Router(config)#**access-list 101 deny tcp host**  **172.16.1.1 host 172.16.2.1 eq telnet**  Router(config)#**access-list 101 permit ip any any** |
| Use the group command to attach an ACL to an interface.  is used under an interface if  the ACL is to filter traffic | Router(config)#**interface fa0/0**  Router(config-if)#**ip access-group 1 out** |
| An example using named ACL in stead of numbers | Router(config)#**ip access-list extended my\_list**  Router(config-ext-nacl)# **deny tcp host**  **172.16.1.1 host 172.16.2.1 eq ftp**  Router(config-ext-nacl)# **permit ip any any** |
| Attaching a named ACL to an interface | Router(config)#**int fa0/0**  Router(config-if)#**ip access-group my\_list in** |
| Configuring a static NAT to allow a server to be access via the Internet, using the IP  address on interface s0/0/1 | Router(config)#**ip nat inside source static**  **10.1.1.2 interface s0/0/1** |
| Defining interface which NAT takes place between | Router(config)#**int fa0/0.1**  Router(config-if)#**ip nat inside** |
| Enables RIPng | Router(config)#**ipv6 unicast-routing**  Router(config)#**ipv6 router rip ccna** |
|  | Router(config)#**int s0/0/0**  Router(config-if)#**ipv6 rip ccna enable** |
| Configure RIPv2 on R1 as the routing protocol and advertise the appropriate connected networks. | Router#**config t**  Router(config)#**router rip**  Router(config-router)#**version 2**  Router(config-router)#**passive-interface g0/1**  Router(config-router)#**network 172.30.0.0**  Router(config-router)#**network 10.0.0.0** |
| Disable auto summarization on all routers. | Router(config)#**router rip**  Router(config-router)#**no auto-summary** |
| Command to clear the routing table. | Router(config-router)#**end**  Router#**clear ip route \*** |
| R2 will advertise a route to the other routers if the default-information originate command is added to its RIP configuration. | Router(config)#**router rip**  Router(config-router)#**default-information originate** |

**Privilege Commands**

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| **Description** | **Commands** |
| Manually starts the setup dialog which is automatically invoked when the device  starts with no config | Switch#**setup** |
| Displays the config held in DRAM. Which is lost if not copy run start command is not used | Switch#**show running-config** |
| Displays the NVRAM (None volatile) config. | Switch#**show startup-config** |
| Saves the config. Without this command all changes/configuration will be lost. | Switch#**copy running-config startup-config** |
| Saves the running config to a  TFTP server | Switch#**copy running-config tftp** |
| Copies IOS files to a TFTP  server | Switch#**copy flash tftp** |
| Copies files from a TFTP  server the device flash | Switch#**copy tftp flash** |
| Erase the config held in NVRAM. If this is followed with the reload command all  configuration is lost | Switch#**erase startup-config** |
| Reboots the device | Switch#**reload** |
| Abort sequence | <Shift> <Ctrl> 6 |
| Suspend Telnet Session | <Shift> <Ctrl> 6(then let all keys go, then)x |
| Show the current sessions. The one with a \* is your active session | Switch#**show sessions** |
| Set the device local clock. **Note** this is not done in config mode | Switch#**clock set 10:00:00 april 2 2008** |

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| Display the IOS version along with other useful info e.g sys uptime, config  register etc | Switch#**show version** |
| Displays the file contents of the flash | Switch#**show flash** |
| Displays the clock | Switch#**show clock** |
| Displays the users currently  logged on | Switch#**show users** |
| By default displays the last  Entered commands | Switch#**show history** |
| Displays the ARP cache | Switch#**show arp** |
| Displays the spanning tree status on vlan 1 | Switch#**show spanning-tree vlan 1** |
| Lists all the configured vlans | Switch#**show vlan** |
| Displays VTP info such as VTP mode, VTP domain, VTP counter. | Switch#**sh vtp status** |
| Ping selected address | Switch#**ping 10.1.1.1** |
| Extended ping. Must be in privilege mode | Switch#**ping** |
| Display the interface status | Switch#**show int fa0/1** |
| Displays the vlan status and the IP address VLAN 1 (often the management vlan) | Switch#**show interfaces vlan 1** |
| Show the SSH configuration. | Switch#**show ip ssh** |
| Displays a list of CDP  neighbours | Switch#**show cdp neighbors** |
| Display IP information about an interface | Switch#**show ip [interface-id]** |
| Extended information on the  above | Switch#**show cdp neighbors details** |
| Display CDP packets as they arrive | Switch#**debug cdp packets** |
| Display ping packets as they arrive | Switch#**debug icmp packets** |
| Display switch MAC Addresses table. These entries are learnt from the source mac address in the  Ethernet frames | Switch#**show mac address-table** |
| Displays the interface operational status and IP addresses for all router interfaces | Router#**show ip interface brief** |
| Displays all the configured routing protocols | Router#**show ip protocols** |
| Displays the IP routeing  table | Router#**show ip route** |
| Displays the NAT  translations | Router#**show ip nat translations** |
| Displays the physical cable  DTE/DCE, x.21, V.35,  RS232 configuration | Router#**show controllers s 0** |
| Displays the end-to-end status. Recall that ‘show  interface’ does not | Router#**show frame-relay pvc** |
| Displays the type of LMI and  the number LMI frames | Router#**show frame-relay lmi** |
| Displays the frame relay  inverse ARP table | Router#**show frame-relay map** |
| To be come neighbours both the local and remote interface must be correctly configured. | Router#**show ip ospf neighbor** |
| If adjacent routers don’t become neighbours. Then use the command to check the local router interface is  configured correctly | Router#**show ip ospf interface** |
| Same information as the above OSPF commands but with EIGRP. Remember that  AS numbers **MUST** match | Router#**show ip eigrp neighbor** |
| Same information as the above OSPF commands but  with EIGRP | Router#**show ip eigrp interface** |
| IPv6 ping. Recall that :: means all zero in between | Router#**ping 2000:1000:500:3::1** |

**Security**

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| Require that a minimum of 10 characters be used for all passwords. | Router(config)#**security passwords min-length 10** |

**Passwords**

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| Sets the encrypted enable  password | Switch(config)#**enable secret cisco** |
| Sets the unencrypted enable  password | Switch(config)#**enable password cisco** |
| Enable password encryption on all clear text password  within the configuration file | Switch(config)#**service password-encryption** |
| Require that a minimum of 10 characters be used for all passwords. | Router(config)#**security passwords min-length 10** |
| Creating a local user in the local database of the router | Router(config)#**username admin privilege 15 secret adminpass1** |

**Router:**

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| Create subinterfaces. | Router#**conf t**  Router (config)#**gig0/0.2**  Router (config)#**gig0/0.3**  Router (config)#**exit** |
| Configure IEEEE .1Q (dot 1Q). | Router (config-subif)#**encapsulation dot1Q**  Router (config-subif)#**ip address 172.16.2.254 255.255.255.0**  *.1Q is a IEEE protocol that adds a label to a trunk. It gives you a better overview. This protocol can track from which vlan the frame is.* |

**Switchport commands:**

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| Assign port F0/5 to VLAN 99 on the switch. | S1(config)#**interface f0/5**  S1(config-if)#**switchport mode access**  S1(config-if)#**switchport access vlan 99**  S1(config-if)#**end** |
| Configure sticky port security on a switch. | S1(config)#**interface f0/19**  S1(config-if)#**switchport mode access**  S1(config-if)#**switchport port-security**  S1(config-if)#**switchport port-security maximum 10**  S1(config-if)#**switchport port-security mac-address sticky**  S1(config-if)#**end** |
| Assign interface to vlan | Switch(config-if)#**switchport access vlan 11** |
| Enable Port Security. | Switch(config-if)#**switchport mode access**  Switch(config-if)#**switchport port-security**  Switch(config-if)#**switchport port-security mac-address sticky** |
| Assign an interface to vlan 2 | Switch(config-if)#**switchport access vlan 2** |
| Unconditionally forces an interface into trunking. Other options are access and  dynamic | Switch(config-if)#**switchport mode trunk** |

**Vlan:**

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| Assign IP address to vlan | **IPv4:**  Switch(config)#**int vlan 1**  Switch(config-if)#**ip addr 172.22.1.11** **255.255.255.0**  Switch(config-if)#**no shutdown**  Switch(config-if)#**description** <enter the tekst>  **IPv6** =  Switch(config-if)#**int vlan 1**  Switch(config-if)#**ipv6 addr 2001:DB8:CAFE:2::1/64**  Switch(config-if)#**no shutdown**  Switch(config-if)#**ipv6 unicast-routing**  Switch(config-if)#**description** <enter the tekst> |
| Create a VLAN on the switch and give it a name. | Switch(config)#**vlan 99**  Switch(config-vlan)#**name Management**  Switch(config-vlan)#**exit** |
| Delete a vlan without reloading the switch. | Switch#**conf t**  Switch (config)#**no vlan …**  Switch (config)#**exit**  For example:  Switch (config)#**no vlan 20**  Switch (config)#**exit** |
| Block an ip address. | Switch(config)#**int vlan 2**  Switch(config-if)#**ip access-group 3 out** |
| Rule out a port from a VLAN. | Switch(config)#**access-list (vlan number) (permit/deny) (address) (inverted subnet mask: /24 = 0.0.0.255)**  For example:  Switch(config)#**access-list 3 deny host 172.16.3.16** |
| Assign port F0/5 to VLAN 99 on the switch. | S1(config)#**interface f0/5**  S1(config-if)#**switchport mode access**  S1(config-if)#**switchport access vlan 99**  S1(config-if)#**end** |
| Add vlan using config mode | Switch(config)#**vlan 11**,  Switch(config-vlan)#**name test** |
| Assign interface to vlan | Switch(config-if)#**switchport access vlan 11** |
| Sets the switch priority for the vlan. This combined with the switch mac address  creates the switch BID | Switch(config)#**spanning-tree vlan 1 priority 4096** |
| Assign an interface to vlan 2 | Switch(config-if)#**switchport access vlan 2** |
| Displays the spanning tree status on vlan 1 | Switch#**show spanning-tree vlan 1** |
| Lists all the configured vlans | Switch#**show vlan** |
| Displays the vlan status and the IP address VLAN 1 (often the management vlan) | Switch#**show interfaces vlan 1** |
| Add a port to a Vlan | Switch(config)#**int fastethernet 0/18**  Switch(config-if)#**switchport mode access**  Switch(config-if)#**switchport access vlan 3**  Switch(config)#**int Gig0/1**  Switch(config-if)#**switchport mode access**  Switch(config-if)#**switchport access vlan 3** |
| Reset all the vlans on the switch. | Switch#**delete flash:vlan.dat** |

**Port commands:**

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| Change a switchport to a routeport. (een switch laten routeren. Kan alleen op een ***layer 3*** switch!) | Switch (config)#**ip routing**  Switch (config)#**int f0/1**  Switch (config-int)#**no switchport**  Switch (config-int)#**ip address 10.0.0.1 255.255.255.252** |
| Turn multiple switchports off.  Turn the gigabit ports off.  (dont forget to turn them off for bonus points) | Switch(config)#**int range fa0/1-24**  Switch(config-int-range)#**shutdown**  Switch(config-int-range)#**exit**  Switch(config)#**int range Gig0/1-2**  Switch(config-int-range)#**shutdown**  Switch(config-int-range)#**exit** |
| Add a description to a port.  (bonus points) | Switch(config)#**int Fa0/1**  Switch(config)#**description Link to PC-A** |
| Place a range in a vlan. | Switch (config)#**int range fa0/1-12**  Switch (config-int-range)#**switchport mode access**  Switch (config-int-range)#**switchport access vlan 2**  Switch (config-int-range)#**exit** |
| Add a trunk between a switch and a router.  Add a trunk to a selected group of vlans. | Switch (config)#**int gig0/1**  Switch (config-if)#**switchport mode trunk**  Switch (config-if)#**switchport trunk allowed vlan 2,3**  ***(only for vlan 2 and 3. Not for the other vlans!)*** |
| Creating a trunk. | Switch(config)#**interface vlan1**  Switch(config-if)#**switchport mode trunk**  Switch(config-if)#**switchport trunk native vlan 2** |

**Interface commands:**

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| Configure an inside ip address. | Router(config)#**ip nat inside source static (inside ip) (outside ip)**  For example: Router(config)#**ip nat inside source static 172.16.16.16 64.100.50.1** |

**Windows Commands**

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| **Description** | **Commands** |
| Traverses data from the user’s originating end device to a distant destination device. | C:\>**tracert** <destination network name or end device address>  C:\>**traceroute** <destination network name or end device address> |
| Ping selected address | C:\>**ping 192.168.1.1** |
| List of all the IP configurations. | C:\>**ipconfig /all** |
| Command to issue an IPv6 ping to the link-local default gateway address. | C:\>**ping -6 <default-gateway-address>** |